

3. Since I wrote my paper on Mr. Hodgson's collection of fishes, I have ascertained that not only all the Indian species of *Therapon* enter fresh waters freely, but that several are exclusively freshwater fish.—A. GÜNTHER.

On the Constitution of the Fruit in the Cruciferæ.

By M. E. FOURNIER.

When a horizontal section is made of a bilocular Cruciferous fruit, especially of a young ovary after the amalgamation of the two parts of the septum, the latter is seen to be bifurcate at each extremity, and to embrace in the angle produced by this bifurcation the elongated column from which the two rows of ovules originate, described by the author as the placenta. This arrangement produces a triangular canal extended longitudinally within each placenta, the horizontal section of which forms a triangle, with its apex at the point of bifurcation of the two lamellæ of the septum, and its base upon the placenta itself.

The placenta presents, passing inwards, the epidermis, a green parenchyma, cortical fibres, ligneous fibres, and tracheæ. The epidermis presents projections formed by the cuticle, which are very common in the Cruciferæ. The green parenchyma completely surrounds the placenta in most genera. It is continuous on each side with the subepidermal parenchyma of the valves, and more internally with the double origin of the septum, which springs directly from it. The cortical fibres exist only on the outer side of the placental column. The woody fibres, which contain chlorophyll at an early period, form around the tracheæ a ring which is thicker exteriorly than interiorly. The trophosperms originate from the placenta, sometimes within, sometimes outside of, the triangular canal; in the former case they perforate one of the lamellæ of the septum, to which they appear to be adnate.

The valves present a double epidermis, the outer one with longitudinally elongate cells, the interior with transverse cells, arranged in two or three series. Within the outer epidermis there is a parenchyma, in which vascular bundles ramify in various ways, according to the genera and species; this is separated from the inner epidermis by a remarkable undescribed fibrous layer. It is formed of very thick fibres, of which the section presents several concentric lines, and strongly refracts light. The form of the section is circular in *Lunaria biennis* and *Psychine*, elliptical in *Sisymbrium*. These fibres, when examined in the middle part of the horizontal section, form a simple row in *Lunaria* and *Sisymbrium*, several rows with parallel elements in *Psychine*, two rows with crossed elements in *Fibigia clypeata*, Med., and several rows with alternately crossed elements in *Raphanus* and *Enarthrocarpus*. Near the placentas they are always approximated, in several rows, and form a thicker tissue than in the middle of the valve. Analogous fibres are met with in many fruits (*Malus*, *Fraxinus*, *Nigella*, *Ervum*); but they are never so frequent in other families as in the Cruciferæ. They are absent from the walls of the ovary in the *Resedaceæ* and *Capparidaceæ*.

Below, these fibres terminate in a point, without attaching themselves to any analogous organ; above they are continuous with a fibrous sheath surrounding the stylar canal; laterally they are in contact with the annular parenchyma which surrounds the placenta, and becomes converted into suberous tissue at maturity, causing the dehiscence of the fruit and the separation of the valves. In the genus *Cardamine*, of which the dehiscence is different, the herbaceous layer of the placenta is interrupted at the level of the line of attachment of the valves.

In certain Cruciferæ, which have a free funiculus and a spherical indehiscent fruit, these fibres do not exist, and the horizontal section of the fruit only shows tracheæ ramifying in a parenchyma.

The anatomical structure of the septum has not yet been thoroughly investigated. Its two lamellæ present at first cells filled with green matter, which in some rare cases is retained until the fruit is mature. The form gradually acquired by these cells, the direction of their elongation, and the thickness of the membranes formed by them may furnish specific and even generic characters for the Cruciferæ. The *Alyssinæ* may even be divided into two sections according to the form of the septal network.

Fibres and vessels are frequently developed between the two lamellæ. Sometimes the cells of the septum acquire the character of fibres upon the median line. In many cases there exists in the middle of the septum a fibrous bundle, which encloses a dotted duct in *Sisymbrium tanacetifolium*. In *Matthiola*, *Malcolmia*, and several *Sisymbria*, of which the author makes a distinct group under the name of *Malcolmiastrum*, there is between the two lamellæ an actual membrane formed of juxtaposed fibres, among which are some tracheæ.

In some genera, especially *Farsetia* (excl. *Fibigia*, Dec.), the fibres of the septum are pierced with holes, by which they communicate, forming a very elegant network unconnected with any fibro-vascular bundle.

In *Psychine stylosa* the septum, which is very transparent and formed of polyhedric cells with delicate and inconspicuous walls, presents long branched tubes of very unequal diameter, with distinct walls and greenish granular contents before the maturity of the fruit. These tubes generally ascend nearly parallel to each other; but they anastomose irregularly, so as to resemble a laticiferous network.

But it is in the triangular canal that these formations, sometimes closely resembling certain varieties of laticiferous vessels, are especially met with, containing, however, only granules of chlorophyll, starch, and fatty matters. They consist of isolated ramose cells, or more frequently of elongated lateral vessels emitting branches at right angles to their direction. Among the various elements of this system we may observe sometimes complete partitions communicating by the ordinary punctures, sometimes walls perforated like sieves, sometimes open canals, probably produced by the disappearance of former partitions.

These anatomical observations throw a new light on the constitu-

tion of the fruit in the Cruciferæ. Upon this point some writers have put forward singular opinions, in consequence of the difficulty originating from the position of the stigmata in this family. Now all those who suppose that the ovules originate from the median part of a carpellary leaf reduced to the placenta, or joined to its fellow upon the median line of the valves, are refuted by the fact that the placenta presents a perfectly peculiar structure. The opinion of De Candolle, that the septum was formed by the reentering margins of the carpels, is also invalidated, as the four lines of bilateral origin of this organ are situated upon the parenchymatous circumplacentary ring, and the structure of the septum is quite different from that of the valves. The fruit is therefore to be regarded as formed of two carpels alternate with the placentas, and of two intervalvar placentas, from which the septum issues on each side and by a double origin.—*Comptes Rendus*, September 4, 1865, p. 404.

Male Generative Organs of Phalangium.

To the Editors of the Annals of Natural History.

Chislehurst, Kent, 5th Sept. 1865.

GENTLEMEN,—The 'Annals and Magazine of Natural History' for this month contains a translation of Dr. Krohn's memoir on the Male Generative Organs of *Phalangium*, in which he points out certain mistakes made by Treviranus and Tulk, and explains the true relation and homologies of those organs.

I had, however, four years ago made the same observations, and given a figure in all essentials identical with that of Dr. Krohn ("On the Generative Organs in the *Annulosa*," 'Philosophical Transactions,' 1861, p. 612).

This memoir appears to have escaped the notice of Dr. Krohn.

I am, Gentlemen, your obedient Servant,

JOHN LUBBOCK.

On the Mode in which the Long-eared Bat captures its Prey.

Botanic Gardens, Regent's Park,
Sept. 14, 1865.

MY DEAR SIR,—I have lately noticed a curious way in which the Long-eared Bat (*Plecotus auritus*) captures its prey; and although it may be familiar to naturalists, I have not found it mentioned by authors.

The peculiar structure of Bats is well known. The highly developed membrane used as the flying-apparatus or wings is also extended from the hind legs to the tail, forming a large bag or net (the interfemoral membrane), not unlike two segments of an umbrella, the legs and tail being the ribs.

Having caught a lively male specimen of the common Long-eared Bat, and placed the little fellow in a wire-gauze cage, and inserted a few large flies, he was soon attracted by their buzz, and, pricking up his ears (just as a donkey does), he pounced upon his prey; but instead of taking it directly into his mouth, he covered it with his body, and beat it by aid of his arms, &c., into the bag or